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used as a sail; it was quite as probably ornamental as protective. This animal belongs to the primitive reptilian order, Pelycosauria of Cope, but it represented a highly specialized side-branch related to the Rhynchocephalia or Proganosauria, as shown by Baur and Case.

Interest in the above series of four is enhanced by the fact that Professor Cope,

and Elk, so far as proportions of the body and the shape of the head are concerned.

Other models are in preparation, and the series of water-color restorations, which now numbers nineteen, is progressing as fast as the complete skeletons are procured and prepared, serving as a basis for anatomical study.

HENRY F. OSBORN.

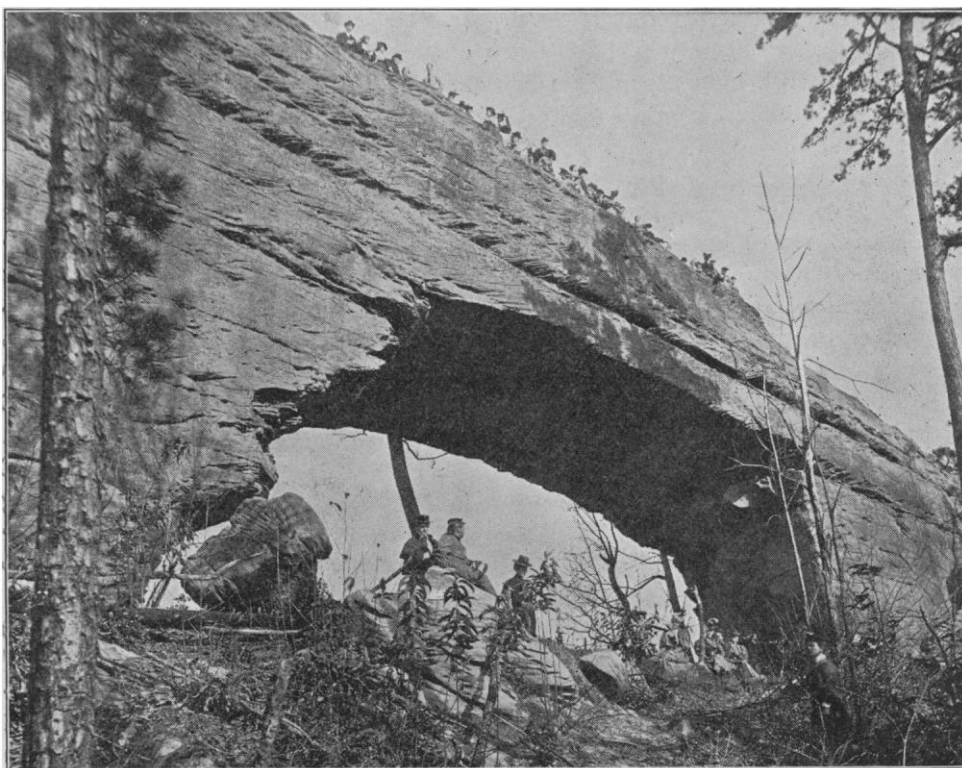


FIG. 1.—Powell County Natural Bridge.

shortly before his death, gave Mr. Knight the benefit of many criticisms and ingenious suggestions.

The latest of this model series is taken from the remarkable skeleton of *Cervalces americanus*, in the Princeton Geological Museum. It is upon a larger scale than the preceding, and represents the animal as Scott has described it, namely, intermediate in form between the Moose

#### NATURAL ARCHES OF KENTUCKY.

ALONG the western margin of the Eastern Coal Field in Kentucky are a number of 'Natural Bridges,' which it seems to me cannot be explained in any of the ways yet suggested. They have not been formed by the falling in of the roofs of underground streams, by wind erosion, or yet again in the manner presented by the contribution on this subject in the May 20th number of

SCIENCE, *i. e.*, by the mechanical action of frost on sandstones exhibiting a tendency to conchoidal fracture.

These natural bridges occur in the strip of very rough country formed by the outcrop of the Basal Coal Measure Conglomerate, where it is underlaid first by shale and then by lower Carboniferous limestone and shaly sandstone. This strip is a part of a deeply multi-dissected plateau, known farther south as the Cumberland Plateau. The tributary streams, deeply buried below the old plateau level, have along the margins of the strip cut down into the underlying shale, limestone and shaly sandstone. They have extended their ramifications up the steep slopes to the base of the Conglomerate, where they have hollowed out their virtual sources in the shale, undermined the Conglomerate cliffs and thus formed vast amphitheaters, or 'rock-houses.' The extent of these is often seemingly out of all proportion to the size of the stream leading away from them. These streams sometimes find continuation above the cliffs as wet-weather streamlets and during the times of their flow plunge over the escarpments in picturesque waterfalls. More commonly, however, there is no gathering ground above. By the recession of sources the watersheds have been reduced to the narrowest ridges, which are often quite inaccessible. In a number of instances two streams in their recession have met in the shales under the Conglomerate. Two 'rock-houses' have met back to back and formed a 'Natural Bridge.' There are three of these bridges in Kentucky that are beginning to have something more than a local celebrity. One of these is in Pulaski, one in Wolfe and one in Powell county. Views of the Powell county bridge accompany this sketch. Perhaps a tendency to conchoidal fracture in the coarse sandstone has favored the hollowing-out process that has resulted in these natural arches, but in the main they

are due to the mechanical action of water causing a recession of sources in the way above indicated.

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THE INTERNATIONAL AËRONAUTICAL CONFERENCE AT STRASSBURG.

THE meeting, ten weeks ago, of the International Aëronautical Committee appointed by the Paris Meteorological Conference of 1896 was noteworthy in two respects. First, it marked the beginning of a new era in meteorological investigation, as shown by an organized effort to cut loose from observatories on the earth and to study the conditions of the free air; and, second, by the assembling at Strassburg of French and Germans, political questions were held to be subservient to the conquest of the high atmosphere and the extension of the common realm of science. Official and private hospitality was abundant and the utmost good fellowship prevailed among the members of the Committee and the other meteorologists, physicists and aëronauts who were present by invitation. It was regretted, although hardly a surprise, that there was no one from Great Britain, where, since Glaisher's remarkable balloon ascension, little has been done to explore the free air. The following named members of the Committee were in attendance: Professor Hergesell, the President, of Strassburg; MM. de Fonvielle, the Secretary, Cailletet and Besançon, of Paris; Drs. Assmann and Berson, of Berlin; Professor Erk, of Munich; General-Major Rykatcheff and Colonel Kowanko, of St. Petersburg; Mr. Rotch, of Boston, United States.

The methods discussed for obtaining observations in the free air were balloons with aëronauts; *ballons-sondes*, or unmanned balloons to carry self-recording instruments to the height of ten miles or more; and,